CLAIMS:

1. A method of identifying passive seismic events in seismic data, the seismic data comprising at least first seismic data traces acquired at a first seismic receiver and second seismic data traces acquired at a second receiver spatially separated from the first receiver, the method comprising: determining an overall measure of similarity for a pair of passive seismic events in the seismic traces, the overall measure of similarity being indicative of similarity between the events acquired at the first seismic receiver and of similarity between the events acquired at the second seismic receiver.

2. A method as claimed in claim 1 wherein the method is a real-time processing method.

3. A method as claimed in claim 1 wherein the overall measure of similarity is an overall correlation coefficient indicative of correlation between the events acquired at the first seismic receiver and of correlation between the events acquired at the second seismic receiver.

4. A method as claimed in claim 3 wherein determining the overall cross-correlation coefficient comprises

(a) determining a first correlation coefficient for the pair of events from the first data;

(b) determining a second correlation coefficient for the pair of events from the second data; and

(c) determining the overall correlation coefficient for the pair of events from the first correlation coefficient and the second correlation coefficient.

5. A method as claimed in claim 1, 2, 3 or 4 and comprising the further step of comparing the overall measure of similarity for the pair of events with a first pre-determined threshold.

6. A method as claimed in claim 5 and comprising the further step of identifying the pair of seismic events as a doublet if the overall measure of similarity is equal to or greater then the first threshold.

7. A method as claimed in claim 4, or in claim 5 or 6 when directly or indirectly dependent from claim 4, wherein the first seismic receiver is a multi-component seismic receiver, and step (a) comprises:

(i) determining respective correlation coefficients for the pair of events for each data component acquired by the first seismic receiver; and

(ii) determining the first correlation coefficient for the pair of events from the respective correlation coefficients.

8. A method as claimed in claim 7 wherein step (i) comprises determining the respective correlation coefficients in the frequency domain.

9. A method as claimed in claim 7 or 8 wherein step (ii) comprises determining the first correlation coefficient as a weighted average of the respective correlation coefficients.

10. A method as claimed in claim 4, or in claim 5 or 6 when directly or indirectly dependent from claim 4, wherein the second seismic receiver is a multi-component seismic receiver, and step (b) comprises:

(i) determining respective correlation coefficients for the pair of events for each data component acquired by the second seismic receiver; and

(ii) determining the second correlation coefficient for the pair of events from the respective correlation coefficients for each data component acquired by the second seismic receiver.

11. A method as claimed in claim 10 wherein step (i) comprises determining the respective correlation coefficients in the frequency domain.

12. A method as claimed in claim 10 or 11 wherein step (ii) comprises determining the second correlation coefficient as a weighted average of the respective correlation coefficients for each data component acquired by the second seismic receiver.

13. A method as claimed in claim 4, or in claim 5 or 6 when directly or indirectly dependent from claim 4, wherein step (c) comprises determining the overall correlation coefficient for the pair of events as an average of the first correlation coefficient for the pair of events and the second correlation coefficient for the pair of events.

14. A method as claimed in claim 13 and comprising determining the overall correlation coefficient for the pair of events according to:

$$C(\tau) = \max_{\tau_l} \left\{ \frac{\sum_{i=1}^{m} C_{Ri}(\tau_l)}{m} \right\}$$

where C_{Ri} is the cross-correlation coefficient for the pair of events for the i^{th} receiver, $\tau_l \in (\tau_l - \Delta t, \tau_l + \Delta t)$, for $l = 1,...m$ and m is the number of receivers.

15. A method of seismic data acquisition comprising: acquiring first seismic data at a first seismic receiver and simultaneously acquiring second seismic data at a second seismic receiver spatially separated from the first seismic receiver; and processing the first and second seismic data according to a method as defined in any of claim 1 to 14.

16. An apparatus for identifying passive seismic events in seismic data, the seismic data comprising first data acquired at a first seismic receiver and second seismic data acquired at a second seismic receiver spatially separated from the first receiver, the apparatus comprising means for determining an overall measure of similarity for a pair of passive seismic events in the seismic traces, the overall measure of similarity being indicative of similarity between the events within the first data traces and of similarity between the events within the second data traces.

17. An apparatus as claimed in claim 16 and adapted to process the seismic data in real time.

18. An apparatus as claimed in claim 16 or 17 and adapted to determine, as the overall measure of similarity, an overall correlation coefficient indicative of correlation between the events within the first data traces and of correlation between the events within the second data traces.

19. An apparatus as claimed in claim 18 and comprising:

means for determining a first correlation coefficient for the pair of events from the first data;

means for determining a second correlation coefficient for the pair of events from the second data;

means for determining the overall correlation coefficient for the pair of events from the first correlation coefficient and the second correlation coefficient.

20. An apparatus as claimed in any of claims 16 to 19 and further comprising means for comparing the overall measure of similarity for the pair of events with a first pre-determined threshold.

21. An apparatus as claimed in claim 16, 17, 18, 19 or 20 and comprising a programmable data processor.

22. A storage medium containing a program for the data processor of an apparatus as defined in claim 21.

23. A storage medium containing a program for controlling a programmable data processor to carry out a method as defined in any of claims 1 to 14.

24. A program for controlling a computer to carry out a method as defined in any of claims 1 to 14.